United States Environmental Protection Agency | Air and Radiation (6202J) | EPA 430-F-97-028 December 2000

SUPPLY VENTILATION SYSTEMS

MECHANICAL EQUIPMENT IMPROVEMENTS

The U.S. Environmental Protection Agency's **ENERGY STAR® Program** promotes the use of high-efficiency technologies and equipment. ENERGY STAR labeled homes use at least 30% less energy than homes built to meet the national Model Energy Code while maintaining or improving indoor air quality. These fact sheets are designed to help consumers learn more about the energy-efficient improvements to their ENERGY STAR labeled homes.

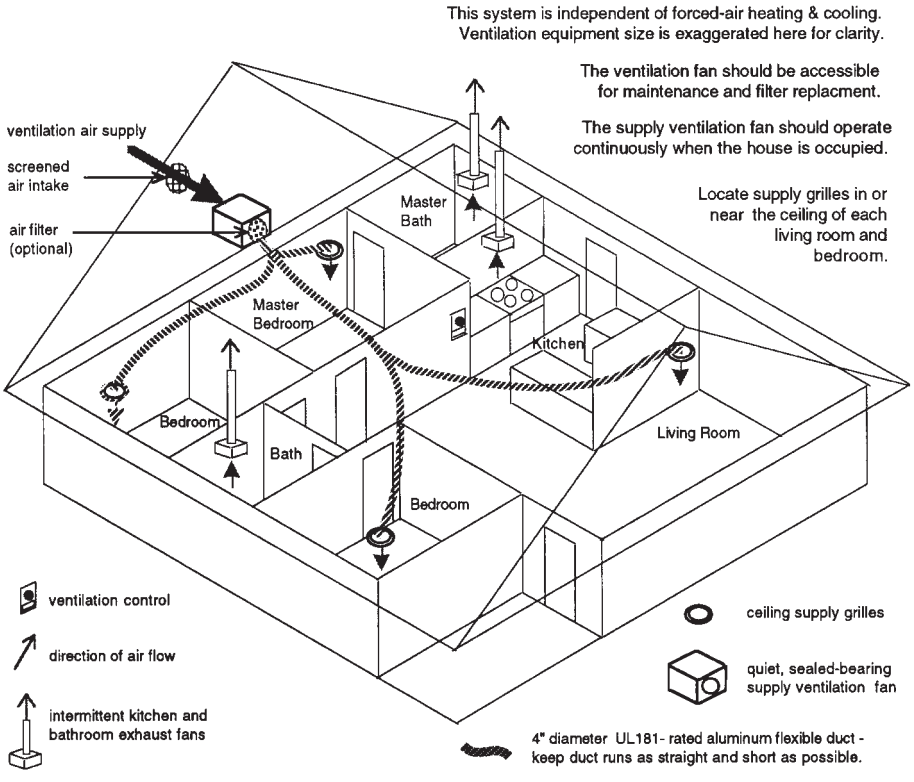
The air within homes can become stale from moisture, odors, and pollutants that penetrate the home or are generated internally by human activity and out gassing from building materials and furnishings. A constant supply of fresh, outdoor air can provide greater assurance of good indoor air quality and improved comfort.

In most homes, ventilation is provided accidentally when air leaks through the building envelope. Accidental ventilation is unreliable because it is dependent on a pressure difference between indoor and outdoor spaces caused by temperature or wind variations. Too much fresh air often enters a house during cold weather, causing uncomfortable drafts and high heating bills. Not enough fresh air may enter during mild weather which can lead to poor indoor air quality.

Air leakage through the building envelope accounts for between 25 percent and 40 percent of the energy used for heating and cooling in a typical residence. Many new homes are being air sealed to reduce this energy use. Where tighter construction reduces air leakage and accidental ventilation, active ventilation systems may be needed to provide fresh air.

Figure 1 shows how supply ventilation works in a small home. Outdoor air enters through a single intake and is distributed through ducts to the living room and bedrooms. Stale air is removed by leakage throughout the building and through exhaust fans located in the kitchen and bathrooms. The supply air intake should be located away from sources of pollution, odor or dust—such as the ground, garages, driveways, and plumbing or dryer vents. Supply systems can be turned off when homes are not occupied.

FIGURE 1: SCHEMATIC DIAGRAM OF SUPPLY VENTILATION SYSTEM



Supply Ventilation Systems

MECHANICAL EQUIPMENT IMPROVEMENTS

Resources

The Consumer Guide to Home Energy Savings (Wilson and Morrill). Available from the American Council for an Energy Efficient Economy at 510-549-9914.

The following fact sheet is available by calling the U.S. Environmental Protection Agency's toll-free Energy Star Hotline at 1-888-STAR-YES (1-888-782-7937): ***Air Sealing***.

Moisture Control in Homes fact sheet available from the Energy Efficiency and Renewable Energy Clearinghouse (EREC), P.O. Box 3048, Merrifield, VA 22116, 1-800-DOE-EREC (1-800-363-3732)

(Continued)

Fresh outdoor air is provided continuously regardless of weather conditions. Indoor air quality is improved where fresh outdoor air, low in pollutants, mixes with indoor air, which has become stale from human activity. Fresh air is provided to the living spaces within a house through properly sized and located vents without causing uncomfortable drafts. Filters and dehumidifiers can be added to the system near the intake to further remove pollutants and provide humidity control needed in hot, humid climates. Thus, they can be used safely with all types of heating and cooling equipment.

Supply ventilation creates positive indoor pressure. This is advantageous in moderate and hot climates because positive pressure avoids pulling hot, humid air into wall cavities where condensation problems can occur. In cold climates, positive pressure can possibly lead to moisture problems if hot, moist air is forced into wall cavities where condensation is likely to occur. In addition, supply ventilation systems avoid "back drafting" combustion gases from appliances and fireplaces into homes.

Benefits

Supply ventilation systems can provide many benefits including:

Improved indoor air quality. Supply ventilation systems continuously provide fresh outdoor air. This proactive approach to ventilation can result in improved indoor air quality.

Improved comfort. Energy Star labeled homes with tight construction and supply ventilation systems can have fewer drafts and a constant supply of outdoor air, resulting in improved comfort.

Improved health. Stale air can cause health problems. It can be responsible for symptoms such as headaches, drowsiness, and respiratory problems. These symptoms are more common in homes with poor ventilation and moisture control. Continuously providing fresh air can result in the improved health and well being of the occupants.

Lower utility bills. Less energy is consumed to operate ventilation systems than to heat and cool excessive amounts of outdoor air that infiltrates leaky homes. This can result in lower utility bills, making homes less expensive to operate.

Improved resale position. Energy Star labeled homes with supply ventilation systems can provide the many impressive benefits listed above, including more comfortable homes with better indoor air quality and lower utility bills. These benefits can translate into higher resale value.